

Brookhaven National Laboratory National Synchrotron Light Source		Number: <b>LS-OPS-0033</b>	Revision: <b>A</b>
		Effective: 6/19/2001	Page 1 of 3
<b>Subject: Work in Areas Subject to Radiation from VUV Injection</b>			
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\*Document must contain approved signatures for validity.

## Purpose

The purpose of this procedure is to minimize radiation exposures to personnel who will be working in areas where radiation levels may be elevated during injection into the VUV ring. This is accomplished by coordinating the work with NSLS operations personnel so that VUV injection is not started until personnel are clear of these areas.

## Scope

The areas covered by this procedure include the following:

- The space more than eight feet above floor level on the VUV experimental floor
- The roof area directly above the VUV ring
- The roof area between the RF Penthouse and the area above the VUV ring
- Any other areas designated by the NSLS Safety Officer based on radiation surveys or the nature of the work to be done

This procedure does not apply to passage through the areas above or occupancy of less than ten minutes in an hour in those areas.

Operation of the Linac/Booster alone or for injection into the Xray ring does not produce significant radiation in the areas designated above, and this procedure does not apply to those activities.

## Responsibilities

NSLS Work Control Coordinators are responsible for identifying jobs that may include work in the areas identified above, and for ensuring that the requirements of this procedure are included in work plans for those jobs.

The NSLS Work Control Manager is responsible for ensuring that the requirements of this procedure are considered in the review of work plans.

Supervisors are responsible for ensuring that their workers who will be entering the areas identified above understand and have been instructed to comply with the requirements of this procedure.

NSLS Control Room Operators and Operations Coordinators are responsible for restricting injection into the VUV ring as required by this procedure when they have been notified of work in progress in the areas identified above.

Work in Areas Subject to Radiation from VUV Injection			
Number: LS-OPS-0033	Revision: A	Effective: 6/19/2001	Page 2 of 3

## Procedure

1. A member of a work crew assigned to work in any of the designated areas shall notify the Control Room Operator at the beginning of the work day or after any extended break, and obtain permission to work in the area. The Operator should discuss the expected injection schedule and work out a means to notify the work crew in the event of an unscheduled injection. For work in the VUV experimental area notification could be by the PA "five minute" announcement and workers on the roof could be notified by beeper or control room radio.
2. Upon being notified that workers will be in the designated areas, the Control Room Operator shall turn the VUV Access Key to Access Mode to "Access" to lock out injection, and place a note next to the key with time, date, location of the work, and means for notification of the workers.
3. At least five minutes before a VUV injection, the Operator shall notify the workers by the means agreed in step 1. Injection may not be started until confirmation is received that all workers are out of the designated area.
4. Upon receiving notification of an impending injection, the workers in the designated area shall leave and notify the Control Room Operator when they are clear of the area. The workers may not re-enter the area until they have confirmation that injection is complete and has been locked out.
5. If the Operator does not receive confirmation that workers are out of the designated area, then a member of the operations staff must go to the area to verify that it is clear of personnel.
6. When VUV injection is complete the Operator will return the Access Key to the Access Mode, place the note, and notify the workers that they may return.
7. At the end of the work day or before an extended break, a member of the work crew shall inform the Operator that no one will be in the designated area until further notice. The Operator should then remove the note and return the key to Normal Mode.

## Alternative Procedure

There may be occasions when it is important for operational reasons to allow injection to the VUV ring while workers are in the designated areas. This is possible if radiation surveys show that potential exposure to workers is low and if operating conditions are carefully controlled.

1. Injection conditions must be normal for the proposed operation. Injection time (defined as the time the VUV injection shutter is open) shall be limited to no more than 10 minutes in any hour. In general, operations with non-standard injection conditions (VUV injection studies and studies requiring injection into non-standard ring tunes, for example) are not suitable for operation under this procedure.
2. A radiation survey by a Radiation Control Technician must be made of the area where workers will have access. VUV injection must be underway as it will be during the

<b>Work in Areas Subject to Radiation from VUV Injection</b>			
<b>Number:</b> LS-OPS-0033	<b>Revision:</b> A	<b>Effective:</b> 6/19/2001	<b>Page 3 of 3</b>

- proposed operation. It may be necessary to do more than one fill and dump to give the RCT sufficient time to do a comprehensive survey.
- 3. The proposed operation must be reviewed and approved by the NSLS Safety Officer.
- 4. A member of the work crew must notify the Control Room Operator each day before the start of work in the area and at the end of the day when workers leave.
- 5. Upon being notified that people will be working in a designated area under this procedure, the Operator shall turn the VUV Access Mode key to "Access" and place a note next to the key stating the area where workers will be and noting limitations on VUV injection. The Operator will turn the key to "Normal" mode for injection and then back to "Access" with the note left in place.
- 6. At the end of the work day, if notification has not been received that workers are out of the area, a member of the Operations Group must go to the area to verify that workers are out of the area before ending this procedure and removing the limitations on injection.